

and the toxin is selected from at least one of PTX, DNT, TCT, and Ac-Hly.

111. (NEW) An immunogenic composition as claimed in claim 99, wherein the composition further comprises at least one of an adhesin of *Bordetella* and a toxin of *Bordetella*; where in the adhesin is selected from at least one of FHA, AGG2, AGG3 and the toxin is selected from at least one of PTX, DNT, TCT, and Ac-Hly.

112. (NEW) An immunogenic composition as claimed in claim 101, wherein the composition further comprises at least one of an adhesin of *Bordetella* and a toxin of *Bordetella*; where in the adhesin is selected from at least one of FHA, AGG2, AGG3 and the toxin is selected from at least one of PTX, DNT, TCT, and Ac-Hly.

113. (NEW) An immunogenic composition as claimed in claim 105, wherein the composition further comprises at least one of an adhesin of *Bordetella* and a toxin of *Bordetella*; where in the adhesin is selected from at least one of FHA, AGG2, AGG3 and the toxin is selected from at least one of PTX, DNT, TCT, and Ac-Hly.

114. (NEW) An immunogenic composition as claimed in claim 106, wherein the composition further comprises at least one of an adhesin of *Bordetella* and a toxin of *Bordetella*; where in the adhesin is selected from at least one of FHA, AGG2, AGG3 and the toxin is selected from at least one of PTX, DNT, TCT, and Ac-Hly.

REMARKS

Entry of this Amendment is respectfully requested. The amendments adding the sequence identifier, SEQ ID NO: 25, to the specification and claims are in response to the requirement by the Office. (See Paper No. 10, page 6. lines 7-9.) In accordance with this requirement, the substitute Sequence Listing includes a new listing for SEQ ID

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NO: 25. The additions of this sequence identifier to the specification and of the sequence to the Sequence Listing do not add new matter.

New claims 98-114 are derived from the pending claims and reflect the election in response to the Restriction Requirement. These new claims do not add new matter.

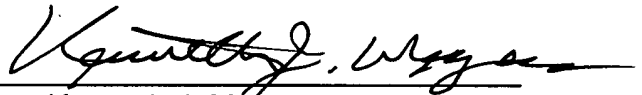
In view of the foregoing amendments and remarks, Applicants respectfully request the reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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Appendix to the Amendment of May 24, 2002

Please amend the application as indicated.

IN THE SPECIFICATION

Page 13, fourth full paragraph, lines 18-24:

In particular, this invention is the result of the discovery that there are different species of the full length pertactin of *Bordetella bronchiseptica*, namely, species containing 6, 7, 8, or 9 repeating PQP amino acids sequences in Region II thereof, and species of full length pertactin of *B. bronchiseptica* containing 1, 2, or 3 repeating GGXXP amino acid sequences (SEQ ID NO: 25) in Region I thereof, where XX can be FD, FG, or AV. These full length pertactins and mixtures of these pertactins in any combination of the repeating sequences are thus provided by this invention.

Page 16, third full paragraph, lines 16-20:

It will be immediately apparent that this invention provides polypeptide fragments of the pertactin of *B. bronchiseptica*, where the fragments comprise 6, 7, 8, or 9 repeating PQP amino acid sequences in Region II thereof or 1, 2, or 3 repeating GGXXP amino acid sequences (SEQ ID NO: 25) in Region I thereof. Mixtures of these polypeptide fragments in any combination of the repeating sequences are also within the scope of this invention.

Page 17, second full paragraph, lines 14-22:

In another embodiment, this invention provides a composition comprising a mixture of *Bordetella bronchiseptica* pertactin variants, wherein each *Bordetella bronchiseptica* pertactin variant comprises Region I of a pertactin of *Bordetella*

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bronchiseptica, and further wherein each *Bordetella bronchiseptica* pertactin variant comprises 1, 2, or 3 repeating GGXXP amino acid sequences (SEQ ID NO: 25) in Region I thereof, and the at least two of the *Bordetella bronchiseptica* pertactin variants differ in the number of the repeating GGXXP amino acid sequences contained therein. This composition can also comprise pertactins of *Bordetella parapertussis*, *Bordetella pertussis*, or mixtures thereof. The *Bordetella bronchiseptica* pertactin variants can be full length or a fragment.

Page 18, first full paragraph, lines 1-9:

In a further embodiment, the invention provides a composition comprising a mixture of *Bordetella bronchiseptica* pertactin variants, wherein one of the *Bordetella bronchiseptica* pertactin variants comprises Region II of pertactin of *Bordetella bronchiseptica* having 6, 7, 8, or 9 repeating PQP amino acid sequences in Region II thereof, and another of the *Bordetella bronchiseptica* pertactin variants comprises Region I of pertactin of *Bordetella bronchiseptica* having 1, 2, or 3 repeating GGXXP amino acid sequences (SEQ ID NO: 25) in Region I thereof. This composition can also comprise pertactins of *Bordetella parapertussis*, *Bordetella pertussis*, or mixtures thereof. The *Bordetella bronchiseptica* pertactin variants can be full length or a fragment.

IN THE CLAIMS

59. (AMENDED) The immunogenic composition of claim 56, wherein the pertactins of *Bordetella* species, fragments and variants thereof, comprise at least one of:

(A) 1, 2, or 3 repeating GGXXP amino acid sequences (SEQ ID NO: 25) of Region I; and

(B) 6, 7, 8, or 9 repeating PQP amino acid sequences of Region II.

60. (AMENDED) The immunogenic composition of claim 56, further comprising at least one of:

(A) 1, 2, or 3 repeating GGXXP amino acid sequences (SEQ ID NO: 25) of Region I; and

(B) 6, 7, 8, or 9 repeating PQP amino acid sequences of Region II

of the pertactins of at least one of:

(C) *Bordetella bronchiseptica*;

(D) *Bordetella parapertussis*; and

(E) *Bordetella pertussis*.

61. (AMENDED) The immunogenic composition of claim 58, further comprising at least one of:

(A) 1, 2, or 3 repeating GGXXP amino acid sequences (SEQ ID NO: 25) of Region I; and

(B) 6, 7, 8, or 9 repeating PQP amino acid sequences of Region II

of the pertactins of at least one of:

(C) *Bordetella bronchiseptica*;

(D) *Bordetella parapertussis*; and

(E) *Bordetella pertussis*.

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